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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,995	03/31/2004	Nicholas D. Spencer	ETH 111	8183
23579 7590 02/12/2007 PATREA L. PABST PABST PATENT GROUP LLP 400 COLONY SQUARE, SUITE 1200 1201 PEACHTREE STREET ATLANTA, GA 30361			EXAMINER LUM, LEON YUN BON	
			ART UNIT	PAPER NUMBER
			1641	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		02/12/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/814,995

Applicant(s)

SPENCER ET AL.

Examiner

Leon Y. Lum

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 5,6,9 and 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,7,8,10-13 and 15-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1/3/05, 6/5/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-4, 7-8, 10-14, and 16-19 in the reply filed on December 15, 2006 is acknowledged.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Claim 13 seems to be missing from the claim set. Therefore, claims 14-19 are misnumbered. Misnumbered claims 14-19 have been renumbered 13-18. The following references to pending claims are directed towards the newly numbered claims.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. Claims 7-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 7-8, the phrase "the surface" is vague and indefinite. It is unclear whether the term "surface" is directed towards the claimed "surface-chemical gradient" or a surface of the claimed "substrate" in parent claim 1.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-4, 7-8, 12, 13, and 15-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Genzer et al (US 6,770,323 B2) (hereinafter "Genzer").

Genzer teaches the step of subjecting a surface to fluid such that the fluid delivers a concentration gradient of component (i.e. first adsorbate) extending generally along a direction of surface (i.e. substrate is exposed to a first solution for a time period sufficient to adsorb the first adsorbate onto the surface in an amount decreasing in concentration from a first area on the substrate to a second area on the substrate),

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wherein the subjecting step comprises dipping the substrate in a liquid bath (i.e. exposing substrate to an advancing front of a first solution comprising the first adsorbate; full immersion). See column 8, lines 22-52 and column 14, lines 36-41.

Regarding claim 2, Genzer teaches that multiple gradients can be formed (i.e. exposing substrate to a second solution comprising a second adsorbate). See column 14, lines 5-11 and 21-35.

Regarding claim 3, Genzer teaches a gradient can be functional gradients tuned to wettable properties, including one that changes from hydrophobic to hydrophilic. See column 9, lines 49-63 and column 14, lines 57-59.

Regarding claims 4 and 8, Genzer teaches that the substrate can be PDMS (i.e. synthetic polymers; hydrophobic polymer) and that the gradient solution can deposit a functional group that reacts with a reactive group on the substrate, wherein the functional groups can be oligonucleotides or polypeptides (i.e. first and second solutions comprise polyelectrolytes). See column 5, lines 7-24; column 6, lines 32-57; and column 8, lines 3-14.

Regarding claim 7, Genzer teaches that the substrate surface can include reactive groups including a peroxide group (i.e. surface is an oxide) and that the gradient solution can deposit a functional group that reacts with a reactive group on the substrate, wherein the functional groups can be oligonucleotides or polypeptides (i.e. first and second solutions comprise polyelectrolytes). See column 6, lines 29-57 and column 8, lines 3-14.

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Regarding claim 13, Genzer teaches that gradient analysis is suitable in studying cellular interactions. See column 1, lines 46-51.

Regarding claim 15, Genzer teaches that the patterned substrates can be used as detection targets (i.e. for analysis comprising exposing the surface-chemical gradient to a molecule). See column 14, lines 54-65.

Regarding claims 16-17, Genzer teaches that PDMS substrates have dimensions of 1x5 cm². See column 17, lines 31-33.

Regarding claim 18, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Since Genzer teaches all the structural limitations claimed, Genzer teaches the instant claim.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Genzer et al (US 6,770,323 B2) (hereinafter "Genzer") in view of Natan et al (US 6,242,264 B1) (hereinafter "Natan").

The teachings of Genzer have been disclosed above, but they fail to teach that the substrate is exposed to the first solution using a linear-motion drive.

Natan teaches the step of using a motorized translation stage to immerse a substrate for producing a gradient coating thereon, in order to immerse the substrate at

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a fixed rate that produces known, repeatable immersion conditions. See column 40, lines 49-64.

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Natan's step of using a motorized translation stage to immerse the substrate of Genzer, in order to immerse the substrate at a fixed rate that produces known, repeatable immersion conditions. The benefit of being able to fabricate gradient substrates with consistent results provides the motivation to combine Natan's step with Genzer's substrate. In addition, one of ordinary skill in the art at the time of the invention would have had a reasonable expectation of success in including Natan's step in the method of Genzer since both Genzer and Natan teach substrates with surface gradients.

11. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Genzer et al (US 6,770,323 B2) (hereinafter "Genzer") in view of Kochersperger et al (US 5,656,034) (hereinafter "Kochersperger").

The teachings of Genzer have been disclosed above, but they fail to teach that the substrate is exposed to the first solution using a syringe pump.

Kochersperger teaches the step of using a syringe pump to deliver a solution, in order to provide a fluid dispensing means having an accurate volumetric fluid delivery. See column 1, lines 42-48.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Genzer with the step of using a syringe pump to

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deliver a solution, as taught by Kochersperger, in order to provide a fluid dispensing means that has an accurate volumetric fluid delivery. The advantage of providing accurate volumetric amounts provides the motivation to combine the teachings of Genzer and Kochersperger. In addition, one of ordinary skill in the art at the time of the invention would have had a reasonable expectation of success in including the syringe pump of Kochersperger with the method of Genzer, since Genzer teaches deposition of fluid onto a substrate and the syringe pump is capable of delivery fluid onto a substrate.

Conclusion

12. No claims are allowed.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Y. Lum whose telephone number is (571) 272-2878. The examiner can normally be reached on weekdays from 8:00am-5:00pm.

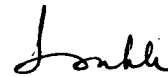
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Leon Y. Lum
Patent Examiner
Art Unit 1641



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